

**ABSTRACT FINAL ID:** SM54A-03;

**TITLE:** Observations of Electron Vorticity in the Inner Plasmashell and its Relationship to Reconnection

**SESSION TYPE:** Oral

**SESSION TITLE:** SM54A. Revelations from Multipoint Measurement: Space Plasma Processes and Dynamics IV

**AUTHORS (FIRST NAME, LAST NAME):** Chris A Gurgiolo<sup>1</sup>, Melvyn L Goldstein<sup>3</sup>, William H Matthaeus<sup>2</sup>, Adolfo -F. Vinas<sup>3</sup>

**INSTITUTIONS (ALL):** 1. Bitterroot Basic Research Inc, Hamilton, MT, United States.  
2. Bartol Research Foundation, University of Delaware, Newark, DE, United States.  
3. Geospace Science Laboratory, Code 673, NASA Goddard Space Flight Center, Greenbelt, MD, United States.

**Title of Team:**

**ABSTRACT BODY:** Spatial derivatives of the electron moments can be estimated using data from the four Cluster spacecraft. Using spatial derivatives of the velocity we have computed the vorticity in the plasmashell for several crossings. What we have found is that vorticity appears to be a common feature in the inner plasmashell. We will show a number of examples. In at least some of the observations the vorticity is well correlated with the passage of Cluster through the ion diffusion region of known reconnection events. That most of the vorticity events observed are reconnection related cannot be dismissed and in fact observations of vorticity may provide a means to locate times when the Cluster spacecraft are magnetically connected to regions where reconnection is taking place. Understanding the role and source of the vorticity should advance our understanding of the dissipation of the turbulence associated with reconnection. In the course of the presentation we will also touch on the methods used to estimate the spatial derivatives as well as the limitations and assumptions involved.

**KEYWORDS:** [2700] MAGNETOSPHERIC PHYSICS, [7500] SOLAR PHYSICS, ASTROPHYSICS, AND ASTRONOMY, [7835] SPACE PLASMA PHYSICS / Magnetic reconnection, [2764] MAGNETOSPHERIC PHYSICS / Plasma sheet.

(No Image Selected)

(No Table Selected)

**SPONSOR NAME:** Chris Gurgiolo

**Additional Details**

**Previously Presented Material:** 0%